

## ABSTRACT

This invention provides materials and methods to manipulate the plant genome at the level of single plant cells in culture resulting in the ability to assign metabolic functionality to plant genes involved in the production of biologically active molecules and to create a means of product discovery based on the biosynthetic capacity of plants. The materials to create an activation mutagenesis include incorporation of enhancer sequences from a plant viral promoter at random places in the plant genome via Agrobacterium mediated DNA transfer (T-DNA). The usefulness is that genes in the immediate vicinity of the incorporation were activated which allows for immediate screening of the mutagenized plant cells. Additionally, the usefulness includes relevant areas of the genome were flanked by the inserted T-DNA which allows recovery of this area by standard molecular biology techniques. The method includes a procedure for screening large numbers of mutagenized plant cell cultures for activation of a relevant gene on the basis of the desired protein product on the basis of radioligand binding displacement assay.

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